

Spinal Cord Injuries

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A spinal cord injury usually begins with a **sudden, traumatic blow** to the spine that fractures or dislocates vertebrae. The damage begins at the moment of injury when displaced bone fragments, disc material, or *ligaments bruise or tear into spinal cord tissue*. Most injuries to the spinal cord don't completely sever it. Instead, an injury is more likely to cause fractures and compression of the vertebrae, which then **crush and destroy the axons**, extensions of nerve cells that carry signals up and down the spinal cord between the brain and the rest of the body. An injury to the spinal cord can **damage a few, many, or almost all of these axons**. Some injuries will allow almost complete recovery. Others will result in complete paralysis.

Spinal cord injuries are divided into **complete** injuries and **incomplete** injuries. It is possible that the classification of the injury may change during recovery. Usually the loss of sensation and motor ability associated with a complete spinal cord injury caused by bruising, loss of blood to the spinal cord, or pressure on the spinal cord; cut and severed spinal cords are rare. Generally, complete spinal cord injuries result in total loss of sensation and movement below the site of the injury. An incomplete spinal cord injury does not result in complete loss of movement and sensation below the injury site.

The level of injury is very helpful in predicting what parts of the body might be affected by paralysis and loss of function. In incomplete injuries there will be some variation in these prognoses.

Neck: Cervical (neck) injuries usually result in quadriplegia.

C-1 to C-4: can result in a loss of many involuntary functions including the ability to breathe, necessitating breathing aids such as mechanical ventilators or diaphragmatic pacemakers.

C-5: C-5 injuries often result in shoulder and biceps control, but no control at the wrist or hand.

C-6: C-6 injuries generally yield wrist control, but no hand function.

C-7 and T-1: Individuals with C-7 and T-1 injuries can straighten their arms but still may have dexterity problems with the hand and fingers. Injuries at the thoracic level and below result in paraplegia, with the hands not affected.

T-1 to T-8: At T-1 to T-8 there is most often control of the hands, but poor trunk control as the result of lack of abdominal muscle control.

T-9-T12: Lower T-injuries (T-9 to T-12) allow good trunk control and good abdominal muscle control. Sitting balance is very good. Lumbar and sacral injuries yield decreasing control of the hip flexors and legs.

Most common injuries are: C5-6, T6-7 and T12-L1

Expert in spinal cord injuries? DSES is always looking for volunteers to help teach or give presentations!!

Resources and Additional Information

National Institute of Neurological Disorders and Stroke; www.ninds.nih.gov/

Spinal Cord Information Network; www.spinalcord.uab.edu/

Spinal Cord Injuries Website; www.sci-recovery.org/

